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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/749,967

01/02/2004

Qi Yu

USP2141A-BDP

9684

30265 7590 01/10/2007

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EXAMINER

BOWERS, NATHAN ANDREW

ART UNIT

PAPER NUMBER

1744

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/749,967

Applicant(s)

YU, QI

Examiner

Nathan A. Bowers

Art Unit

1744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21, 29, 32, 36 and 2428 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21, 2428, 29, 32 and 36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

- 1) Claims 21 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koo (US 5234985) in view of Wey (US 20050061157) and Uenishi (US 6099634).

Koo discloses a transparent resin composition that is formed by mixing a raw plastic material with far infrared ray emitting ceramic powders. This is disclosed in column 1, line 40 to column 2, line 54. Column 3, lines 23-26 indicate that the plastic/ceramic mixture is used to form the walls of a food container. The emitted far infrared rays work to reduce germ contamination, as this is a natural feature of far infrared rays. Koo, however, does not disclose that the disclosed food containers are bottles with caps, or that nano titanium oxide particles are mixed with the ceramic far infrared ray emitting particles.

Wey discloses an adhesive sticker that can be attached to a beverage serving means. Paragraph [0032] states that the sticker contains a far infrared ray emitting material (Figure 1:11) comprised of a ceramic powder. The sticker is intended to be attached to a water bottle, as shown in Figure 3. Paragraph [0033] teaches that self-adhesive infrared radiating device can be placed on any beverage serving means. It is an intrinsic feature of this invention that the sticker may be placed on the cap portion of a plastic bottle containing a detachably sealing cap (Figure 3 illustrates a bottle with a lid), as plastic bottles in combination with lids is well known. Paragraph [0035] states that transition metal oxides, such as titanium oxide, are added to the ceramic powder.

Uenishi discloses the use of nano-scale titanium oxide ultraviolet light absorbers *integrally* mixed with various plastic materials. In column 1, lines 7-65 and throughout the reference, Uenishi teaches that nano titanium oxide particles are integrated into a variety of polymers to form structures that are protected from photochemical degradation.

Wey, Koo and Uenishi are analogous art because they are from the same field of endeavor regarding the formation of films to be applied to plastic containers.

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At the time of the invention, it would have been obvious to use the far infrared emitting ceramic/plastic composition disclosed by Koo to form a bottle with a detachable cap. Wey teaches that plastic bottles containing beverages would benefit from the addition of far infrared emitting ceramics since the infrared rays would serve to preserve, energize, and enhance the taste of the liquid inside. Far infrared rays are also well known in the art as a germ decontamination means.

It would have also been obvious to mix nano titanium oxide particles into the plastic composition in order to give the formed plastic bottle UV absorbing properties. In column 1, lines 7-37, Uenishi teaches that ultrafine titanium oxide particles are conventionally used in the art to provide plastics with an enhanced tolerance to UV light. Nano metal oxide coatings provide long-term protection from radiation, are highly transparent, and therefore are good to use in conjunction with plastic containers.

2) Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koo (US 5234985) in view of Wey (US 20050061157 A1) and Uenishi (US 6099634), as applied to claims 21 and 29, and further in view of Andrews (US 20050171253 A1).

Koo, Wey and Uenishi disclose the apparatus and method set forth in claims 23, 24, 31 and 32 as set forth in the 35 U.S.C. 103 rejection above, however do not expressly disclose that the infrared ray emitter and nano titanium oxide are in a 1:10,000 weight ratio with the plastic material of the liquid container. Koo, Wey and Uenishi do not disclose that far infrared ray emitters and nano titanium oxides are added in a 1:1 weight ratio.

Andrews discloses a method for forming plastic containers that are comprised of various ultraviolet-absorbing moieties in order to protect foodstuffs and beverages from the deleterious effects of UV radiation. The UV absorbers are integrally mixed with the plastic material to integrally form the container body. This is disclosed in paragraph [0001] and paragraphs [0024] through [0028]. In paragraph [0202], it is disclosed that the added UV blockers are in a 1:10,000 weight ratio (0.01%) with plastic container material.

Koo, Wey, Uenishi and Andrews are analogous art because they are from the same field of endeavor regarding the addition of far infrared ray emitting and/or UV absorbing compounds to plastic containers.

At the time of the invention, it would have been obvious to integrally mix the titanium oxide and infrared emitting powder protective arrangement disclosed by Koo, Wey and Uenishi with the plastic material of the container body in order to form a product with a desirable additive to raw plastic material ratio. It would have been apparent to add the titanium oxide and infrared ray emitter protective arrangement mix at the same 1:10,000 weight ratio disclosed by Andrews, especially since his UV absorbers and the protective arrangement mixture disclosed by Wey and Uenishi essentially perform identical tasks by preventing excess ultraviolet light from entering the plastic container. This concentration is beneficial because it provides for UV blocking and infrared emitting compounds scattered throughout the plastic in an amount that is high enough to be effective. Furthermore, the concentration is not so high that it is still possible to attain significant increases in performance corresponding to increases in concentration, because the plastic is not saturated with additives.

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At the time of the invention, it would have also been obvious to add far infrared ray emitters and nano titanium oxides at a 1:1 ratio. The ratio of infrared ray emitter to UV absorber merely represents a result effective variable that can be optimized through routine experimentation. At the time of the invention, it would have been obvious to provide infrared ray emitters and UV absorbers in the most effective proportion. Accordingly, it would have been clear to provide these two compounds at a 1:1 ratio if it was determined that this ratio produced the best results.

3) Claims 28 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koo (US 5234985) in view of Wey (US 20050061157 A1), Uenishi (US 6099634) and Andrews (US 20050171253 A1) as applied to claims 24 and 32, and further in view of Watanabe (US 6296943 B1).

Koo, Wey, Uenishi and Andrews disclose the apparatus and method set forth in claims 24 and 32 as set forth in the 35 U.S.C. 103 rejection above, however, do not expressly disclose that the protective arrangement comprises 5% far infrared ray emitter and nano titanium oxide by weight and 95% water by weight.

Watanabe discloses that a method for producing a titanium oxide composite sol that may be applied as a coating to plastics, glass, and ceramics. In column 5, lines 38-39 and column 14, line 65 to column 15, line 62, Watanabe states that titanium oxide particles 2-20 nm in size are used in making the coating, and that other metal oxides may be incorporated in order to insure that the coating is capable of blocking UV rays without resulting in a color change. Column 23, line 38 to column 24, line 17 teaches a method for manufacturing the coating in which an

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aqueous coating containing around 5% titanium oxide by weight is formed (step b-d). Routine experimentation would allow for one of ordinary skill in the art to determine an optimum titanium oxide weight percentage. Although Watanabe goes on the state that the water is substituted by methanol to form the finished coating (step e), this step is not essential for the formation of a functional coating. Watanabe's product that is around 5% by weight titanium oxide and the majority water, and a coating that is 5% titanium oxide and 95% water are not identical, but are similar in that that one of ordinary skill in the art would have expected them to have the same properties, according to *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Koo, Wey, Uenishi, and Watanabe are analogous art because they are from the same field of endeavor regarding the formation of plastic resins containing additives.

At the time of the invention, it would have been obvious to produce a plastic comprising 5% far infrared ray emitter and nano titanium oxide by weight and 95% water by weight. Watanabe states in column 7, lines 4-10 that plastics comprising 5% by weight infrared emitter and nano titanium oxide constituted and 95% water are effective because coatings containing a smaller concentration of "active components" are poor in efficiency and uneconomical, whereas coatings containing higher concentrations are undesirable because the viscosity of the coating becomes too large. Furthermore, coatings containing higher amounts of titanium oxide and infrared emitter are unlikely to experience significant increases in germ inhibition and UV protection.

Response to Arguments

Applicant's arguments filed 30 October 2006, with respect to the 35 U.S.C. 103 rejections involving the combination of Koo, Wey and Mager have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the combination of Koo, Wey and Uenishi.

As described in the rejection above, Uenishi addresses the deficiencies of the Mager reference by indicating that it is known in the art to provide nano titanium oxide particles *integrally* mixed with a plastic material.

Conclusion

This is a non-final rejection.

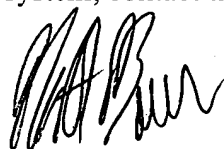
No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A. Bowers whose telephone number is (571) 272-8613. The examiner can normally be reached on Monday-Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys Corcoran can be reached on (571) 272-1214. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



NAB



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SUPERVISORY PATENT EXAMINER